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EXAMINER	
BAREFORD, KATHERINE A	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/500,350	MARUTIAN ET AL.	
	Examiner	Art Unit	
	Katherine A. Bareford	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The amendment of April 14, 2008 has been received and entered. With the entry of the amendment, claims 1-5 are pending for examination.

Claims

2. The Examiner notes that the status identifier of claim 2 should apparently read "currently amended", rather than "currently presented".

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

(A) **Claim 1, line 14**, provides that said aluminum coatings are applied without . . . "or preheating to within austenitic temperatures prior to the plunging step" as is now claimed by the amendment of October 12, 2007 and April 14, 2008. As well, **claim 2,**

line 14 also makes this requirement, **claim 4, lines 13-14**, provides that said aluminum coatings are applied without . . . "or preheating to within austenitic temperatures prior to the plunging step the product prior to plunging in the melt", and **claim 5, lines 15-16**, provides that said aluminum coatings are applied without . . . "or preheating to within austenitic temperature prior to the plunging step". The Examiner has reviewed the disclosure as originally filed, however, there is no support for excluding such preheating. The original disclosure provides "product surface preparing" (as in claim 1, line 2) and then coating with the aluminum melt. This claimed feature is a "negative limitation", and as discussed in MPEP 2173.05(i):

> Any negative limitation or exclusionary proviso must have basis in the original disclosure. If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims. See In re Johnson, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977) ("[the] specification, having described the whole, necessarily described the part remaining."). See also Ex parte Grasselli, 231 USPQ 393 (Bd. App. 1983), aff 'd mem., 738 F.2d 453 (Fed. Cir. 1984). The mere absence of a positive recitation is not basis for an exclusion. Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Note that a lack of literal basis in the specification for a negative limitation may not be sufficient to establish a prima facie case for lack of descriptive support. Ex parte Parks, 30 USPQ2d 1234, 1236 (Bd. Pat. App. & Inter. 1993).

Here, there is simply no discussion one way or the other as to preheating features, and as discussed above, the mere absence of a positive recitation is not a basis for exclusion. In the amendment of October 12, 2007, applicant argues that the lack of literal support does not, in an of itself, establish a prima facie case for lack of adequate descriptive

support citing Ex parte Parks, and argues that the facts of this case are very similar to those set forth in Parks, with the present disclosure accurately conveying the concepts set forth in the claim terms at issue, with it being apparent from applicant's specification that the coating process is conducted without preheating, since there is no disclosure anywhere that any such preheating takes place, and persons skilled in the art would readily understand that no such preheating takes place since the specification does not describe or insinuate in any manner that such preheating occurs, and if such preheating was part of applicant's process the invention would not be sufficiently enabled under 35 USC 112, first paragraph. The Examiner has reviewed these arguments, however, she disagrees. The present disclosure provides generally "preparing the surface" with jet abrasive preparing and then goes on to describe specific features of the aluminum alloy coating using a melt. To one of ordinary skill in the art this simply does not amount to it being apparent that commonly known "preparing" steps would NOT be included, such as, as shown by Rallis and Gierek, conventionally known cleaning and preheating steps. In fact, from the shown prior art, it appears that one of ordinary skill in the art would expect preheating to be conventional. Rather, the description in the disclosure merely indicates that the focus of the claimed invention is on the abrasive treatment and the details of the melt coating with the aluminum alloy. Here, a lack of disclosure about what happens before the focus of the claimed invention would not rise to a teaching that conventional steps necessarily do not happen. This differs from Parks description of a step that would cry

out for a teaching of a material that would be used if it was, in fact, used. Therefore, the amendment contains new matter.

In the amendment of April 14, 2008, applicant further argues that paragraph [0004] of the published application indicates disadvantages of the prior art and the Summary of the Invention notes that the present invention "solves the problem of decreasing the temperature of aluminum melt, . . ."; and thus the disclosure specifically states that it solves the problem in the art of applying aluminum melt at high temperatures by decreasing the temperature of the aluminum melt; and such resolution of the problem in the art therefore cannot occur by including a preheating step. The Examiner has reviewed these arguments, however, the rejection is maintained. Paragraph [0004] has no indication as to preheating one way or another. While the present invention may allow for decreasing the temperature of the aluminum melt, there is absolutely no indication from applicant's quoted statements that this means that preheating would or would not be present, and therefore provides no support for specifically excluding preheating.

(B) **Claim 2, lines 13-14**, provides that said aluminum coatings are applied without . . . "presence of copper in the melt" as is now claimed by the amendment of April 14, 2008. The Examiner has reviewed the disclosure as originally filed, however, there is no support for excluding copper from the melt. Copper is never mentioned in the disclosure as originally filed, and is certainly never excluded from the alloy. The original disclosure provides that the aluminum alloy melt "is alloyed with zinc, silicon,

magnesium, tin . . ." (see page 2 of the specification, and original claim 1) and also that benefits are provided by "alloying the aluminum melt, comprising zinc, silicon, magnesium and tin" (page 3, second paragraph, of the specification), and also note comprising language at page 4, lines 1-2 of the specification. This open language of "comprising" indicates that the aluminum alloy provided must include zinc, silicon, magnesium and tin as claimed, but that other materials can be included in the alloy. The claimed exclusion of copper is a "negative limitation", and as discussed in MPEP 2173.05(i):

> Any negative limitation or exclusionary proviso must have basis in the original disclosure. If alternative elements are positively recited in the specification, they may be explicitly excluded in the claims. See In re Johnson, 558 F.2d 1008, 1019, 194 USPQ 187, 196 (CCPA 1977) ("[the] specification, having described the whole, necessarily described the part remaining."). See also Ex parte Grasselli, 231 USPQ 393 (Bd. App. 1983), aff 'd mem., 738 F.2d 453 (Fed. Cir. 1984). The mere absence of a positive recitation is not basis for an exclusion. Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Note that a lack of literal basis in the specification for a negative limitation may not be sufficient to establish a prima facie case for lack of descriptive support. Ex parte Parks, 30 USPQ2d 1234, 1236 (Bd. Pat. App. & Inter. 1993).

Here, there is simply no discussion one way or the other as to the use of copper, and as discussed above, the mere absence of a positive recitation is not a basis for exclusion. In the amendment of October 12, 2007, applicant argues that the lack of literal support does not, in an of itself, establish a prima facie case for lack of adequate descriptive support citing Ex parte Parks, and arguing that the facts of this case are very similar to

those set forth in Parks, with the present disclosure accurately conveying the concepts set forth in the claim terms at issue, with it being apparent from applicant's specification that if copper was required, description of such would have been necessary to meet the enablement and written description requirements of 35 USC 112, first paragraph. The Examiner has reviewed these arguments, however, she disagrees. The present disclosure provides using an aluminum alloy with comprising language that indicates that the alloy can include other than the specifically listed ingredients. To one of ordinary skill in the art this simply does not amount to it being apparent that commonly known further alloying materials, such as copper (see Japan 50-005213), cannot be used. In fact, from the shown prior art, it appears that one of ordinary skill in the art would expect inclusion of copper to be conventional. While applicant may not have provided support for specific inclusion of copper, applicant certainly did not provide support such that one reading the disclosure would know that copper must specifically be excluded. This differs from Parks description of a step that would cry out for a teaching of a material that would be used if it was, in fact, used. Therefore, the amendment contains new matter.

In the amendment of April 14, 2008, applicant further argues that the concept that applicant's process does not involve introduction to copper into the melt is reasonably conveyed form the specification as originally filed, with the description and preferred embodiments not describing copper or the use of other elements besides zinc, silicon, magnesium and tin as alloys. The Examiner has reviewed these arguments,

however, the rejection is maintained. As discussed in the paragraph above, the lack of a positive recitation of copper is not a basis for exclusion given the comprising language of the original specification and the known conventional use of copper. Applicant has made no showing that one of ordinary skill in the art would, from a reading of the present disclosure, necessarily think that copper was excluded.

(C) **Claim 3, line 10-11**, provides that said plunging in aluminum melts is "for a period of 2 minutes or less" as is now claimed by the amendment of April 14, 2008. The Examiner has reviewed the disclosure as originally filed, however, there is no support this time period of 2 minutes or less. All times of exposure (as described in Tables 1 and 2) to the melt, are 40 seconds or more and 120 seconds (2 minutes) or less. However, the 120 second time period is for a comparative example. The time of exposure for the actual inventive material is precisely 70 seconds in Table 1 and 70 or 80 seconds in Table 2. Thus, there is simply no support for the broad range claimed and the claim contains new matter.

5. Claims 1-5 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1, last three lines, "said aluminum coatings further achieving a Mandrel test of 10 mm, whereby said Mandrel test uses a mandrel having minimum diameter of

10 mm". The specification describes testing "plasticity of the coatings" by "testing the pattern on bending around the cylindrical mandrel, while wending on which the coating on the pattern doesn't break" (page 3, first paragraph), with description of "Minimum diameter of mandrel, mm" in Table 1, which appears to indicate that "10 mm" refers to "diameter of mandrel". This simply does not provide an adequate description of how the "Mandrel test" works such that this test can be reproduced, understood or compared, and thus one of ordinary skill in the art would not be able to make and/or use the invention. First, it is unclear what is meant by "pattern" or "wending". Furthermore, it is unclear to what degree the "coating" is wound around the mandrel, such as, must it go 100%, 10 degrees, 90 degrees, etc. It is also unclear what thickness the substrate is or is not, which would clearly affect how much winding could occur. As well, it is not clear what the mandrel is made from. All of those features would affect the resulting results from using the "Mandrel test", and none are clarified in the disclosure or claims as filed. Moreover, if this is a known standardized test, such as an ASTM test, it is not clear from the claim or disclosure what this test would be. **This rejection also applies to the use of "a Mandrel test" in claim 2, claim 3, claim 4 and claim 5.**

In the amendment of April 14, 2008, applicant argues that as to the understanding of what is required by "Mandrel test", a simple Google search indicates that this is a commonly known test in the industry for determining the flexibility and adhesion of surface coatings by bending coated metal panels around mandrels, citing

"composite.about.com." Applicant further argues that they are not required to explicitly describe terms that are well known in the art such as "Mandrel test", and moreover, the Examiner has the initial burden to establish a reasonable basis to question enablement. The Examiner has reviewed these arguments, however, the rejection is maintained. The Examiner first notes that applicant, in the disclosure, has not referred to a specific test, but rather provided a general description of a testing with bending. The Examiner has clearly met the initial burden of establishing a reasonable basis to question enablement, by noting the various issues as to why it is unclear what is required by this testing process, so that it can be reproduced, understood or compared, including the questions as to what is meant by "pattern" or "wending", what degree of winding is required, what the thickness of the substrate is, what the mandrel is made from, for example. Applicant's general citation that "Mandrel test" is a commonly known test, in no way provides a showing through convincing argument and/or evidence that what is described by applicant' disclosure is the same "Mandrel test" and, further, what one of ordinary skill in the art would understand the features of a "Mandrel test" to require such that the issues raised by the Examiner as to what is meant by "pattern" or "wending", what degree of winding is required, what the thickness of the substrate is, what the mandrel is made from, for example, are clarified.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-5 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 13-14, "or preheating to within austenitic temperatures prior to the plunging step" is confusing as to what is required. The claim does not clarify what is preheated (the product to be coated?, the aluminum alloy?), what austenitic temperatures are referred to (the product?, the aluminum alloy?). Furthermore, if the preheating refers to the aluminum alloy, the claim contradicts itself, because the alloy must be heated for coating (to 660-680 degrees C). **This rejection also applies the use of preheating as claimed in claim 2, claim 4 and claim 5.**

In the amendment of April 14, 2008, applicant argues that the claims have been clarified to indicate that preheating does not occur prior to plunging, and "It is only during the plunging step that the temperature of the melt is in the range of 660-680°C." The Examiner has reviewed these arguments, however, they do not overcome the above rejections. For example, it is still not clarified as to what is preheated or not -- the substrate, the alloy material, etc.; or what austenitic temperature are referred to. Furthermore, applicant's statement that "the melt" is only in the claimed temperature range during plunging is confusing as to how "the melt" gets to that temperature "only" during application.

Claim 1, last three lines, "said aluminum coatings further achieving a Mandrel test of 10 mm, whereby said Mandrel test uses a mandrel having a minimum diameter of 10 mm". The specification describes testing "plasticity of the coatings" by "testing the pattern on bending around the cylindrical mandrel, while wending on which the coating on the pattern doesn't break" (page 3, first paragraph), with description of "Minimum diameter of mandrel, mm" in Table 1, which appears to indicate that "10 mm" refers to "diameter of mandrel". This simply does not provide an adequate description of how the "Mandrel test" works such that this test can be reproduced, understood or compared. First, it is unclear what is meant by "pattern" or "wending". Furthermore, it is unclear to what degree the "coating" is wound around the mandrel, such as, must it go 100%, 10 degrees, 90 degrees, etc. It is also unclear what thickness the substrate is or is not, which would clearly affect how much winding could occur. As well, it is not clear what the mandrel is made from. All of those features would affect the resulting results from using the "Mandrel test", and none are clarified in the disclosure or claims as filed. Moreover, if this is a known standardized test, such as an ASTM test, it is not clear from the claim or disclosure what this test would be. **This rejection also applies to the use of "a Mandrel test" in claim 2, claim 3, claim 4 and claim 5.**

In the amendment of April 14, 2008, applicant argues that the claim is sufficiently clear as to the Mandrel test, especially to persons skilled in the art already familiar with the Mandrel test. The Examiner has reviewed these arguments, however, the rejection

is maintained. As discussed in the 35 USC 112, first paragraph rejection as to enablement above, applicant has not provided appropriate convincing arguments and/or evidence that the Mandrel test would be understood by those of ordinary skill in the art. Since one does not know what the test is, the confusion, as discussed above, remains as to what is required.

Claim 4, lines 13-14, "or preheating to within austenitic temperature prior to the plunging step the product prior to plunging in the melt" is confusing as worded, because "prior to the plunging step the product prior to plunging in the melt" appears to confusingly duplicate the "prior to the plunging" statements.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not

commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claims 1-2 and 4-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rallis (US 4655852) in view of Japan 50-005213 (hereinafter '213).

Rallis teaches a method of applying aluminum alloy coatings on steel products. Column 2, lines 1-10, 34-50 and 64-68. Rallis teaches that the product is first prepared for coating. Column 2, lines 10-40 (heat treating) and column 6, lines 40-60 (heat treating and cleaning before coating). The cleaning preparation can include grit blasting (which would be a jet abrasive) the product. Column 6, lines 40-60. Rallis then teaches that the prepared product is then plunged into a hot dip aluminum alloy melt bath to coat the product with the aluminum alloy. Column 6, lines 55-68, for example and column 2, lines 35-50 and 64-68. The temperature of the bath can be 1000 to below 1341 degrees F (approximately 538 to 727 degrees C). Column 2, lines 34-40. Rallis further teaches that the bath can include aluminum alloyed with zinc, silicon, magnesium and tin materials. Column 2, line 64 through column 3, line 5. The Examiner understands Rallis to perform the application of the aluminum coating without flux, as the process of Rallis has no teaching of applying flux (see Examples I and II, for instance).

Claim 2: Rallis teaches alloying additives of copper can be used, but its use is optional. See column 2, line 65 through column 3, line 5.

Rallis teaches all the features of this claim except (1) the precise temperature of the melt bath and the precise amounts of zinc, silicon, magnesium, and tin to be used in the aluminum melt, (2) the mandrel test features (claims 1-2, 4-5) and (3) the lack of preheating (claims 1-2, 4-5).

However, '213 teaches that a desirable aluminum alloy composition for improved corrosion resistance includes 2-18 % silicon, 2-8 % zinc, 0-2% magnesium and 0.1-1.5% Sn. See the Abstract. The Examiner notes that while the English language abstract refers to 0.5% copper in the alloy, this is a typographical error, and that '213 teaches 0-5% copper (which therefore means that no copper can be used), as shown on page 61, 1st column where " . . . Si 2-18%, Zn 2-8%, Cu 0-5%, Mg 0-2 % , Sn 0.1-15%. . . " is described, and also notes in the example in the abstract where 0.02 % copper is used which is below 0.5 % copper.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to (1) modify Rallis to optimize the temperature of the melt bath for the specific aluminum alloy used given that Rallis teaches a temperature range of approximately 538 to 727 degrees C, and where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, it would have been obvious to modify Rallis to perform the hot dip coating of the aluminum alloy using an alloy with the components and range taught by '213 with an expectation of providing a desirably

corrosion resistant plated article, because Rallis teaches a desirable method for providing hot dip coating of an aluminum alloy on a steel product using an aluminum alloy that can contain aluminum, zinc, silicon, magnesium and tin and '213 teaches a desirable aluminum alloy containing aluminum, zinc, silicon, magnesium and tin for improved corrosion protection. It would further have been obvious to optimize within the taught range of '213 to determine the optimum or workable ranges by routine experimentation. See In re Aller, 200 F.2d 454, 105 USPQ 233 (CCPA 1955). The Examiner understands the ranges given in '213 to be in weight percent as the description is in the conventional format for describing weight percent of alloys. (2) As to the resulting coating meeting the claimed mandrel test features, the Examiner notes the confusion as to what is actually required by the Mandrel test as discussed in the 35 USC 112, first and second paragraph rejections above. However, it is the Examiner's position that the coating method provided by Rallis in view of '213 would provide a coating that meets the claimed Mandrel test, because Rallis in view of '213 provides a coated article with an aluminum alloy of the percentage requirements of zinc, silicon, magnesium and tin, which is what appears to be required to meet the Mandrel test as described by applicant in the specification, and the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). The Examiner also notes MPEP 2112, as noting that "[T]he discovery of a previously

unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." Atlas Powder Co. v. Ireco Inc., 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). (3) As to the coating without preheating as claimed, the Examiner notes the confusion as to what is actually required by the preheating as discussed in the 35 USC 112, second paragraph rejection above. However, it is the Examiner's position that it would have been obvious to perform the coating method of Rallis in view of '213 without preheating, to the extent claimed. While Rallis teaches a heating treatment of the product before coating to within the austenitizing temperature of the product (column 2, lines 15-25), it would have been obvious to one ordinary skill in the art to modify Rallis in view of '213 to perform the coating process without the preheating process, as it has been held that omission of an element and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. *In re Karlson*, 136 USPQ 184. Here, Rallis teaches that the preheating step allows for maintaining high strength carbon and steels after aluminizing (column 3, lines 5-20), and therefore, it high strength is not desired, it would have been obvious to eliminate the element of preheating, which allows saving time and energy. See also MPEP 2144.04, section II.

11. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gierek et al (US 4070210) in view of Rallis (US 4655852) and Japan 50-005213 (hereinafter '213).

Gierek teaches a method of applying aluminum alloy coatings on cast iron and steel products. Column 2, lines 35-65 and column 5, lines 25-26 and 44-45. Gierek teaches that the product is first prepared for coating. Column 5, lines 25-35 (preheating and cleaning before coating). Gierek then teaches that the prepared product is then plunged into a hot dip aluminum alloy melt bath to coat the product with the aluminum alloy. Column 5, lines 25-35, for example and column 2, lines 35-65. The temperature of the bath can be 550-950 degrees C, such as 550 to 650 degrees C.. Column 2, lines 50-60 and column 5, lines 25-30. Gierek further teaches that the bath can include aluminum alloyed with metal such as zinc, silicon, magnesium and tin materials. Column 2, lines 50-55. Gierek provides that the aluminum coatings can be applied without flux when desired. Note Example VI, column 5, lines 25-40 where the coating is applied without any flux treatment as compared to Example VII, column 45-50, where a flux treatment is applied.

Claim 1, 2, 4, 5: as to preheating the product, Gierek does not teach preheating to austenitic temperatures, as Gierek teaches preheating to 100 to 400 degrees C at most. Column 2, lines 55-65 and see example VI, column 5, lines 25-30.

Claim 2: Gierek teaches that copper can be an alloy material with aluminum alloy, but that its use is optional. Column 2, lines 50-53.

Claim 3: Gierek discloses that the time in the melt can be 1-10 minutes. Column 3, lines 40-45. It can also be 30 seconds to 10 minutes. Column 4, lines 5-10. Therefore, the time in the melt can be less than 2 minutes, such as 1 minute or 30 seconds, since In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).

Gierek teaches all the features of this claim except (1) the pretreatment with jet abrasive, (2) precise temperature of the melt bath and the precise amounts of zinc, silicon, magnesium, and tin to be used in the aluminum melt and (3) the mandrel test features (claims 1-5).

Rallis teaches a method of applying aluminum alloy coatings on steel products. Column 2, lines 1-10, 34-50 and 64-68. Rallis teaches that the product is first prepared for coating. Column 2, lines 10-40 (heat treating) and column 6, lines 40-60 (heat treating and cleaning before coating). The cleaning preparation can include grit blasting (which would be a jet abrasive) the product. Column 6, lines 40-60. Rallis then teaches that the prepared product is then plunged into a hot dip aluminum alloy melt bath to coat the product with the aluminum alloy. Column 6, lines 55-68, for example and column 2, lines 35-50 and 64-68. The temperature of the bath can be 1000 to below 1341 degrees F (approximately 538 to 727 degrees C). Column 2, lines 34-40. Rallis further teaches that the bath can include aluminum alloyed with zinc, silicon, magnesium and tin materials. Column 2, line 64 through column 3, line 5.

Moreover, '213 teaches that a desirable aluminum alloy composition for improved corrosion resistance includes 2-18 % silicon, 2-8 % zinc, 0-2% magnesium and 0.1-1.5% Sn. See the Abstract. The Examiner notes that while the English language abstract refers to 0.5% copper in the alloy, this is a typographical error, and that '213 teaches 0-5% copper (which therefore means that no copper can be used), as shown on page 61, 1st column where " . . . Si 2-18%, Zn 2-8%, Cu 0-5%, Mg 0-2 % , Sn 0.1-15%. . . " is described, and also note in the example in the abstract where 0.02 % copper is used which is below 0.5 % copper.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gierek to (1) provide that the "cleaning" process before coating includes grit blasting (jet abrasive treatment) as suggested by Rallis with an expectation of desirable cleaning results, because Gierek teaches to provide a "cleaning" process before aluminum alloy melt coating and Rallis teaches that it is well known for "cleaning" to include grit blasting when preparing a surface for aluminum alloy melt coating. (2) It would further have been obvious to modify Gierek in view of Rallis to optimize the temperature of the melt bath for the specific aluminum alloy used given that Gierek teaches a temperature range of approximately 550 to 950 degrees C, including 650 degrees C, and where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). Furthermore, it would have been obvious to modify Gierek in view of

Rallis to perform the hot dip coating of the aluminum alloy using an alloy with the components and range taught by '213 with an expectation of providing a desirably corrosion resistant plated article, because Gierek teaches a desirable method for providing hot dip coating of an aluminum alloy on an iron or steel product using an aluminum alloy that can contain aluminum and alloying metal such as zinc, silicon, magnesium and tin and Rallis also teaches to providing hot dip coating of an aluminum alloy on a steel product using an aluminum alloy that can contain aluminum and zinc, silicon, magnesium and tin, and that such alloy materials can be added in combination, and '213 teaches a desirable aluminum alloy containing aluminum, zinc, silicon, magnesium and tin for improved corrosion protection. It would further have been obvious to optimize within the taught range of '213 to determine the optimum or workable ranges by routine experimentation. See In re Aller, 200 F.2d 454, 105 USPQ 233 (CCPA 1955). The Examiner understands the ranges given in '213 to be in weight percent as the description is in the conventional format for describing weight percent of alloys. (3) As to the resulting coating meeting the claimed mandrel test features, the Examiner notes the confusion as to what is actually required by the Mandrel test as discussed in the 35 USC 112, first and second paragraph rejections above. However, it is the Examiner's position that the coating method provided by Gierek in view of Rallis and '213 would provide a coating that meets the claimed Mandrel test, because Gierek in view of Rallis and '213 provides a coated article with an aluminum alloy of the percentage requirements of zinc, silicon, magnesium and tin, which is what appears to

be required to meet the Mandrel test as described by applicant in the specification, and the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). The Examiner also notes MPEP 2112, as noting that "[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." Atlas Powder Co. v. Ireco Inc., 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999).

Response to Arguments

12. Applicant's arguments filed April 14, 2008 have been fully considered but they are not persuasive.

(A) As to the rejection using Rallis in view of '213, applicant argues that Rallis requires preheating to a temperature above 1341 degrees F to within the austenitizing temperature range, disallowed by all the claims; and that '213 also does not provide a suggestion for lack of preheating. As to the obviousness to perform without preheating by omission of the preheating and its benefit, applicant argues that references as whole must be considered and fact specific analysis must be made, and here the Examiner did not provide a reasonable suggestion for eliminating the preheating step as it is necessary it increase the yield strength of the steel article to a minimum of 60,000 psi.

The Examiner has reviewed these arguments, however, the rejection is maintained. While Rallis does provide preheating, the Examiner has specifically indicated why it would have been obvious to one of ordinary skill in the art to omit the step of preheating. While applicant argues that the Examiner has not considered the reference as a whole and or made a fact specific analysis, the Examiner disagrees. A reading of the reference as a whole, and analyzed indicates that all of the described steps, including preheating are provided to achieve a yield strength of a minimum of 60,000 psi. This provides products for use in corrosion and high temperature environments. Column1 , lines 15-25. However, it is the Examiner's position that one of ordinary skill in the art would know that steel, etc. is not always used in such corrosion and high temperature environments and high strength is not always needed. As a result, it is entirely reasonable to provided that when high strength is not needed, one of ordinary skill in the art would clearly understand that the preheating austenitizing step would not be needed, which would allow saving time and energy, as it has been held that omission of an element and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. *In re Karlson*, 136 USPQ 184.

(B) As to the rejection using Gierek in view of Rallis and '213, (1) applicant argues that Giereck only discloses an aluminum alloy with a single alloying metal, with no teaching or suggestion to modify Giereck with the four claimed metals. (2) Applicant further argues that Rallis in view of '213 does not provide aluminum alloys

on cast iron and steel without preheating to within the austenitizing range and that Giereck also teaches preheating within the austenitizing temperature range, with upper bounds 270 degrees C higher than the upper temperature allowed by the present invention. As to the overlapping temperature ranges cited by the Examiner, applicant argues that it is not clear what result the Examiner thinks would be optimized by substantially lowering the temperatures described by Giereck to below austenitizing range to arrive at applicant's claimed preheating temperature range. (3) As to the lack of copper in the claimed invention, applicant argues that while the Examiner argues that the statement in '213 that a desirable aluminum alloy includes 0.5% copper is a typographical error, it is the applicant's position that it is more likely that 0-5% copper (page 61 first column of '213) is the typographical error.

The Examiner has reviewed these arguments, however, the rejection is maintained. (1) As to the argument that Giereck does not disclose alloys containing multiple materials, the Examiner notes that Giereck does disclose that each of the four materials can be alloyed with aluminum, and the Examiner has further provided Rallis and '213 as to the suggestion and conventionality of using all of these four materials in combination when providing aluminum alloys. One of ordinary skill in the art would expect desirable coating results from following the process of Giereck, when using the alloy suggested by Rallis and '213, because in Giereck each of the individual materials can be used, indicating that no component described would be incapable of being used in the application process. (2) As to the preheating, as to Rallis in view of '213, the

Examiner notes the discussion in section (A) above. As to the lack of preheating in Giereck, the Examiner does not understand where applicant reads Giereck as providing preheating above the austenitizing temperature. Giereck provides possible preheating at 100 to 400 degrees C (column 2, lines 60-62, and see column 5, lines 25-30), which would be below austenitizing. Thus, the primary reference to Giereck does not teach preheating to austenitizing temperatures. As to upper bounds 270 degrees higher than the upper temperature of the present invention, does applicant mean the 550 to 950 degree C temperature of Giereck's alloy bath (column 3, lines 53-57)? This is not a preheating of the substrate, but rather the temperature of the bath (melt) at immersion, which overlaps with applicant's claimed (660-680 degrees C). Similarly, as to the obviousness of optimizing form a range, the Examiner is describing optimizing the temperature of the bath (melt), not the preheating temperature. If the bath cannot be preheated to the temperature used for plunging, it is unclear how the melt can be achieved for plunging. (3) As to the lack of copper, the Examiner disagrees with applicant's position. The teaching within the Japanese patent document of '213 (page 61, first column) is the controlling teaching of what '213 itself provides, and thus the range of 0-5 % controls. The provision of 0.5% in the abstract is in a separate document later provided by Derwent. Furthermore, the Examiner has also clearly provided why the abstract provision of 0.5 % by Derwent is clearly a typographical error, because within that same Derwent abstract a provision of Cu at 0.02% is made, which

contradicts 0.5%, but is within the range of 0-5% (in a specimen corresponding to example 1 of '213, at the Table at page 62, first column).

Conclusion

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571) 272-1413. The examiner can normally be reached on M-F(6:00-3:30) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katherine A. Bareford/
Primary Examiner, Art Unit 1792